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US EPA RECORDS CENTER REGION 5



513954

PRAIRIE DU CHIEN - JORDAN AQUIFER

MONITORING WELL PLAN FOR

WELLS W401, W402, AND W403

ERT

A RESOURCE ENGINEERING COMPANY

**PRAIRIE DU CHIEN - JORDAN AQUIFER
MONITORING WELL PLAN FOR
WELLS W401, W402, AND W403**

**Submitted to the
U.S. Environmental Protection Agency, Region V
Minnesota Pollution Control Agency
and
Minnesota Department of Health**

**Submitted by
Reilly Tar & Chemical Corporation
Indianapolis, Indiana**

**Pursuant to
Remedial Action Plan Section No. 7.2.5
Exhibit A to the Consent Decree in
United States of America, et al
vs.
Reilly Tar & Chemical Corp., et al
U.S. District Court
District of Minnesota
Civil No. 4-80-469**

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SECTION A

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**PRAIRIE DU CHIEN - JORDAN AQUIFER
MONITORING WELLS W401, W402, AND W403**

Section 7.2.5 of the Consent Decree - RAP requires a Work Plan for the construction or reconstruction of three Prairie du Chien - Jordan Aquifer monitoring wells at the locations shown in Figure 1. This plan provides the results of an investigation of existing wells that may be substituted for new wells within 2500 feet of wells W401 and W402, and provides construction plans for a new well located near France Avenue at West 38th Street in Minneapolis (W403).

WELL W401

On April 29, 1987 Reilly Tar & Chemical Corp. (Reilly) submitted a plan for investigating existing wells to the EPA and MPCA. In accordance with that plan, existing wells located within 2500 feet of the terminus of Homedale Avenue south of Goodrich Street in Hopkins (Interlachen Park) were considered for use as monitoring well W401. Although many candidate wells were identified in the investigation plan, two wells that were not known to Reilly in May 1987 are the best substitute existing wells in the area for monitoring well W401.

The two wells are located within approximately 100 feet of each other and are owned by Interlachen Country Club and used for irrigating the club's golf course (Figure 2). Neither well is on record with the Minnesota Geological Survey, and Minnesota Unique Numbers have apparently not been assigned to these wells.

The well log for Interlachen Country Club Well No. 3 is shown in Figure 3. The well was drilled in 1949 to a depth of 483 feet. This well probably penetrates the full thickness of the Prairie du Chien-Jordan Aquifer (based on 78-foot average thickness of the Jordan Sandstone in St. Louis Park Municipal Wells). In 1977, Bergerson Caswell recased the well with 311 feet of 10-inch pipe. Therefore the well is now only open to the Prairie du Chien-Jordan Aquifer.

The head groundskeeper at the Interlachen Country Club has indicated the club's willingness to cooperate and allow either of its two wells to be used for monitoring purposes. However, owing to the critical current use of both wells for irrigation purposes during the unusually hot and dry season this year, the club cannot allow either well to be taken out of service for video inspection or further investigations. Barring an extended cool rainy period of at least one week, detailed inspections that

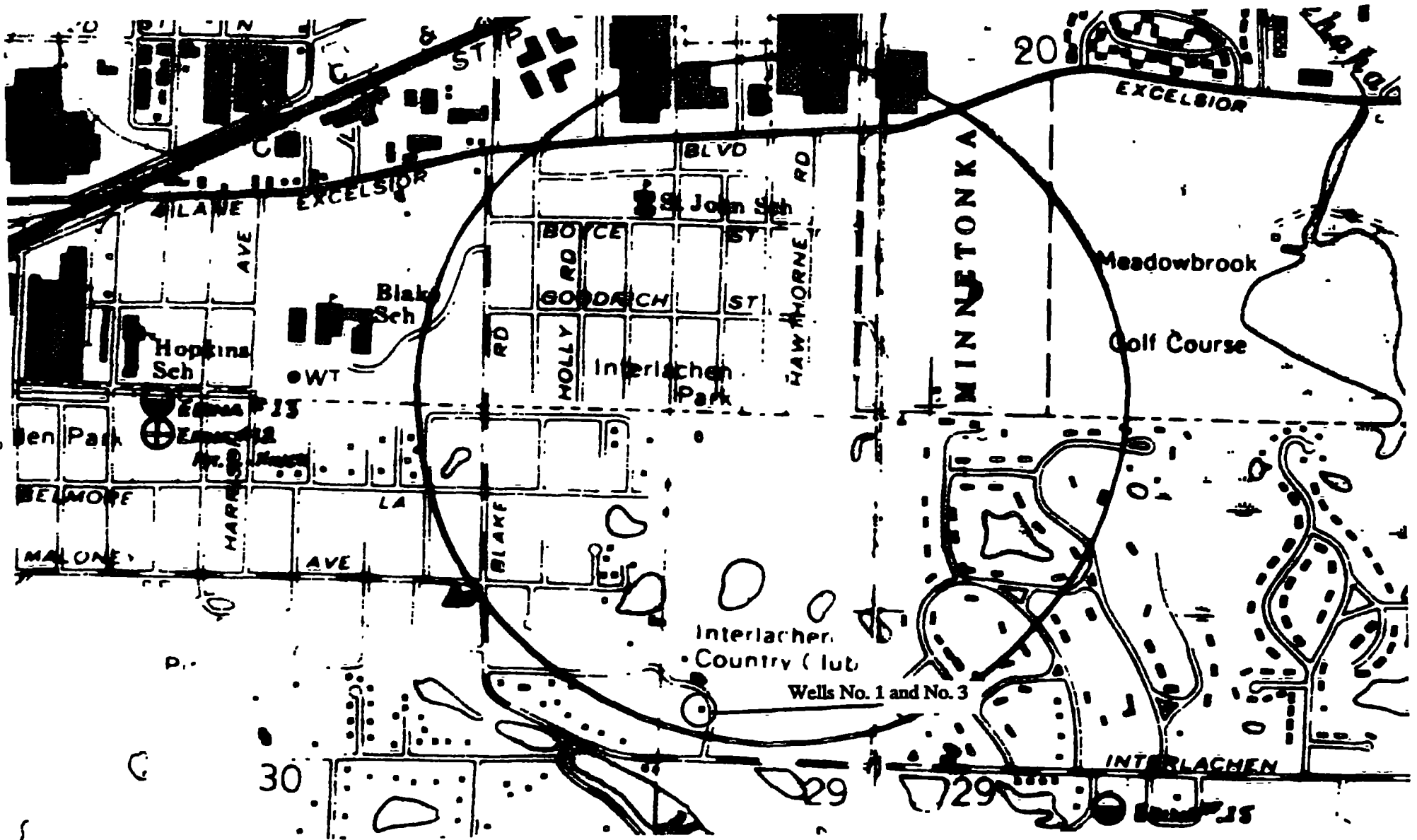


Figure 2 Locations of Interlachen Country Club Irrigation Wells No. 1 and No. 3

REPORT

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Tack No.

Well No. 3

Town..... Edina

Date Started..... 8/1/49 Machine No. 24L Int. State..... Minnesota

Date Completed..... 9/7/49 Owner..... Interlachen Country Club

Location..... Total Depth of Well..... 483"

DIAMETER OF HOLE	12"	10" X 12"	8"		
Top of Pipe above Surface.....	+ 1'	208' + 1			
Top of Pipe below Surface.....	220'	293' 310'			
Bottom of Pipe below Surface.....	221'	87' 311			
No. of Ft. of Pipe in the Hole.....	293' ?	190' ?			
No. of Ft. of Hole Drilled.....					

TEST	1	2	3	4	FORMATION	Thickness	Depth
Depth of the Hole.....	483						
Depth to Water at Rest.....	92				Clay	60	60
Depth to Water Pumping.....					Muddy gravel	30	90
Depth of Pump Pipe.....					Sand	10	100
Gallons per minute.....					Muddy gravel	7	107
Will well supply more?.....					Broken lime and mud	1	108
Was Strainer in Hole?.....					Muddy gravel	29	137
Was water clear?.....					Muddy gravel and sandrock	71	208
Was well pumping sand?..					Soft sandrock	12	220
Hours Pumping.....					Shale and sandrock	63	283
					Hard rock	122	405
					Jordan sandrock	78	483
					(Shaley below)		

STRAINER

Make.....		
Type of Metal....		
Diameter O. D.....		
Diameter I. D.....		
Total Length.....		
Number.....		
Top of Screen below Surface.....		
No. of Ft. Exposed.....		
Bottom of Screen below Surface.....		
Was Str. swedged.....		
Did Sand come thru Str.....		
Was Str. coarse enough.....		
Style of Fittings.....		

All measurements taken from

Figure 3 Well Log for Interlachen Country Club Well No. 3

(FROM BERGERSON-CASWELL, INC.)

involve pulling the pumps will have to wait until this fall. At that time, Interlachen Country Club Well No. 3 will be investigated according to the May 1987 plan.

Prior to the time a detailed investigation can be performed to confirm the integrity of the well, this well should be utilized for monitoring well W401. The 10-year old liner should be in excellent condition for many years to come, and the well's active status during much of the year ensures that water samples from the well will be representative of a large area of the Prairie du Chien-Jordan Aquifer. The monitoring frequency of well W401 is annually, so at most only one sample would be collected from this well before its apparent suitability for monitoring could be confirmed.

If Interlachen Country Club Well No. 3 is found to be unsuitable for monitoring, then a detailed inspection of Well No. 1 should be performed. Figure 4 shows a repair report for the well from July 2, 1958 (with two additional notes of repairs in recent years).. Well No. 1 was drilled in 1911 to a depth of 415 feet. Based on this well's proximity to Well No. 3, the geologic log should be about the same. The bottom of Well No. 1 at 415 feet probably coincides with the contact between the Prairie du Chien and Jordan Formations. The bottom of the casing in Well No. 1 at 214 feet probably coincides with the shaley basal St. Peter confining bed. This type of well construction, where the casing terminates in the basal St. Peter and an open hole is drilled through the Prairie du Chien Aquifer, was a common practice in this area of Minnesota. For example, wells W40, W48, as well as many wells that are not being monitored for the Reilly site are constructed this way. Because of the much higher transmissivity of the Prairie du Chien Aquifer compared to the basal St. Peter confining layer, ground water samples and water level measurements in Interlachen Country Club Well No. 1 would be representative of the Prairie du Chien-Jordan Aquifer.*

In summary, Interlachen Country Club Well No. 3 should be used for monitoring well W401 at the present time. In cooperation with Interlachen Country Club, the well should be investigated in detail after the summer pumping season.

*Based on bulk aquifer transmissivities, the Prairie du Chien-Jordan Aquifer is 2.5 to 7.5 times more transmissive than the St. Peter Aquifer. Assuming an effective "aquifer" thickness of approximately 35 feet in the basal St. Peter confining layer, the Prairie du Chien-Jordan Aquifer would be an average of about 15 times more transmissive than the basal St. Peter. The relative contribution of water from the different strata to the well during pumping reflects the ratio of the transmissivities. Hydrologic data taken from: "Study of Groundwater Contamination in St. Louis Park, Minnesota", Submitted to the Minnesota Department of Health by Eugene A. Hickok and Associates, Geraghty and Miller, Inc., and Henningson, Durham, and Richardson, Inc., November 1981.

REPORT

Copy in log book /sf

Tack No.

Well No. 1

Town. Edina

Date Started. Machine No. State. Minnesota

Date Completed. 1911 Owner. Interlachen Country Club

Location. Total Depth of Well. 415'

DIAMETER OF HOLE	8"				
Top of Pipe ^{above} Surface	0				
Bottom of Pipe below Surface	214' 4"				
No. of Ft. of Pipe in the Hole					
No. of Ft. of Hole Drilled					

TEST	1	2	3	4	FORMATION	Thickness	Depth
Depth of the Hole	415						
Depth to Water at Rest	119						
Depth to Water Pumping							
Depth of Pump Pipe							
Gallons per minute							
Will well supply more?							
Was Strainer in Hole?							
Was water clear?							
Was well pumping sand?..							
Hours Pumping							

STRAINER

Make			
Type of Metal			
Diameter O. D.			
Diameter I. D.			
Total Length			
Number			
Top of Screen below Surface			
No. of Ft. Exposed			
Bottom of Screen below Surface			
Was Str. swedged			
Did Sand come thru Str.			
Was Str. coarse enough			
Style of Fittings			

This data obtained 7/2/58 when pump was pulled by us.

All measurements taken from top of pump base 7/2/58.

7/2/58 - Pump pulled, repaired, and reinstalled. /JWH
 12/84 - Pump pulled, inspected, repaired, and reinstalled. /kam

Figure 4 Repair Record for Interlachen Country Club Well No. 1

(FROM BERGERSON-CASWELL, INC.)

If the results of the investigation are favorable, Interlachen Country Club Well No. 3 should be used as monitoring well W401 permanently. If the investigation reveals problems, the well should be reconstructed or upgraded to a condition suitable for use as monitoring well W401, or Interlachen Country Club Well No. 1 should be investigated for potential use as monitoring well W401. If neither Interlachen Country Club Well is able to be used, then other candidate wells should be investigated to determine their suitability for monitoring the Prairie du Chien-Jordan Aquifer.

WELL W402

Figure 5 shows the location of a well owned by Edina Cleaners with Minnesota Unique Number 200545. The Minnesota Geological Survey Well Log Statement and a repair report are shown in Figures 6 and 7. These documents indicate that the well was drilled in 1948 and probably penetrated the full thickness of the Prairie du Chien - Jordan Aquifer. In 1964 the well was given a new liner which was cemented into place. The geologic formations above the Prairie du Chien - Jordan Aquifer are cased, and the remainder of the well is open hole.

In order to verify the information presented on the well log and repair record, a video inspection and TV log of the well was made on June 23, 1987. The TV log showed that the well is in good condition and matches the information on the logs very well. The results of the TV log are summarized as follows:

- Water level is approximately 112 feet deep;
- The reduction from 8-inch casing to 6-inch casing occurs at 135 feet;
- The bottom of the 6-inch casing is at 297 feet;
- "Typical" solution channel geometry and texture was apparent in the Prairie du Chien portion of the well;
- The contact between the Prairie du Chien and Jordan Formations occurs at 410 to 414 feet;
- The bottom of the well is at 454 feet;
- There were no holes in the casing; and
- There was no sign of water flowing in the well.

Based on the accuracy of the written records for this well, and on the good condition of the well observed in the TV log, no additional logs were made. The water level of 112 feet (approximately at an elevation of 790 feet) agrees with the USGS Water Supply Paper 2211 potentiometric contour map for the Prairie du Chien - Jordan Aquifer during summer months (Figure 8). The owner of Edina Cleaners has indicated his willingness to cooperate and let his well be used for monitoring purposes.

WELL W403

No suitable existing wells were found within 2500 feet of France Avenue at West 38th Street in Minneapolis (W403). Therefore, a new Prairie du Chien - Jordan Aquifer monitoring well will be constructed at Minikahda Vista Park in the City of St. Louis Park (Figure 9). Figure 10 shows the construction details for the new well. Well W403 will penetrate the full thickness of the Prairie du Chien - Jordan Aquifer, and will have a finished diameter of five inches. Well W403 will meet the requirements of the Minnesota Water Well Construction Code, and will provide water level and water quality information representative of only the Prairie du Chien - Jordan Aquifer in accordance with Section 7.2.5 of the RAP.

Direct rotary drilling techniques will be used to construct well W403. The sequence of well construction activities will be:

1. Mobilize and set-up rotary rig.
2. Drill and drive 10-inch diameter, schedule 40 steel casing from the ground surface to the top of the Platteville Formation (approximately 70 feet).
3. Drill nominal 10-inch diameter open hole through the Platteville, Glenwood, and St. Peter Formations to the top of the Prairie du Chien Formation (approximately 180 feet).
4. Install 5-inch diameter, schedule 40 steel casing leaving approximately two feet of pipe above grade.
5. Grout 5-inch casing into place using tremie, and let grout set 48 hours.
6. Drill nominal 5-inch diameter open hole to the base of the Prairie du Chien-Jordan Aquifer (approximately 200 feet).
7. Construct well head with locking cap and 3 protective posts.

A licensed well driller will be contracted to install monitoring well W403. All grout and other material specifications will conform with the requirements of the Minnesota Department of Health Water Well Construction Code. The drilling site will be kept neat and clean at all times. Drilling fluids, cuttings, and other debris will be disposed of according to applicable regulations. Because the drilling site for well W403 is remote from the Reilly site and beyond the area of ground-water contamination, no special contingency plans for dealing with contaminated materials are required for this well construction activity.

SURVEY

Upon completion of constructing well W403, a surveyor will be contracted to determine the latitude, longitude, and the elevation of the water level measuring point for wells W401, W402 and

14-226

V. 41-97
Rev. 3-30-1MINNESOTA CONSERVATION DEPARTMENT
DIVISION OF WATERS

WELL LOG STATEMENT

File No.

Well No. 25,24,7444

MAIL REPORT PROMPTLY TO DIRECTOR, DIVISION OF WATERS, STATE OFFICE BLDG., ST. PAUL 1, MINN.

Location of Well 3903 Sunnyside Ave.

Name

County

Morningside

City or Town

Describe Further by Lot, Block, Nearest Highway, Street and Number

Locate Well on
Plot of Section

Sec.

Top.

Range

Drilled for: Vent Gate Theater

Driller: Max Ranner Well Company

Address 3903 Sunnyside Ave.

Address 28-24-7 ddd a b

Morningside, Minnesota

Date of Completion 7-15-48

Date of Test

Site

Upland, Valley, Hillside, etc.

Type of Well

Dig, Driven, Bored, Drilled

Drill Rig Used

Solid Tool, Jet, Rotary

Diameter: Top 10"x8"x6"

Bottom

Depth of Well 497'

Ground Elevation 900

Sea Level Datum or Give Distance Above

or Below R. R., Highway, Lake, Etc.

Height of Casing Above Ground

Quality of Water

Hard or Soft, Fresh or Salty, Etc.

Temperature of Water

Was Laboratory Analysis Made?

For What Purpose Will Water Be Used?

Is Well Pumped? Pump Capacity GPM

Was Well Sealed on Completion?

Does Well Overflow Without Pumping?

Yes or No

Natural Flow GPM

What Pressure, or Head, at Ground Level?

Principal Aquifer Penetrated

REPORT OF PUMP-TESTING TEST

Duration of Test

Min.

Rate of Pumping

GPM

Static Water Level

Ft. (540)

Water Level While Pumping

Ft.

Drawdown Ft.

Time Required for Recovery

Expected Average Yield Gal. per day

If Other Tests were Made, Give Details on Another Sheet.

Were Measurements Made of Effect on Other Nearby Wells During Test? Give Details.

Figure 6a Well Log for Edina Cleaners Well

(FROM MINNESOTA GEOLOGICAL SURVEY)

905
16
285

WELL LOG

Geologic Formations Kind, Color, Hard or Soft	Thickness of Formation	Depth in Feet		Casing Diam.	Notes
		From	To		
Sand	PLTS SAND	0	79		
Sandy clay	CLAY	79	86		
Platteville L/R.	OPVL LMSN	86	115	7 1/4"	PM14 (34)
Glenwood Sh. Shale	OPWD	115	120		
St. Peter S.R.	SINCS	120	245		SP750 (164)
Green shale	OSTP SILE	245	264		
Dirty St. Peter	SINCS	264	284		
Shakopee Dolomite	OPDC DLMT	284	414		8 - 0616 (130)
Jordan S.R.	EJDN SINCS	414	497		7 486 (83)
					10" hole to 285" then re-
					duced to 8"
					86' 5" of 10" pipe
					64' 2" of 8" pipe
					152' 3" of 6" pipe
	OPDC CJDN				
					10" O + L 86' 5"
					8" 86' 5" to 150' 7"
					6" 150' 7" to 332' 10"
					Indicate Size, Type, & Location of Any Screens, Gravel Packs, Grouting, or Other Development

I hereby certify that, to the best of my knowledge, the data presented in this statement is a true and correct representation of conditions encountered in the construction of this well.

Dated at _____ this _____ day of _____, 19__.

(Firm Name) Max Renner Well Company

By J. A. Dal 3-9-60

Title: _____

Figure 6b Well Log for Edina Cleaners Well.

REPORT

Tack No.

Well No.

By Renner approx. 1938 - Repaired B-C Town Edina

Date Started 1964 Machine No. State MN

Date Completed Owner Westgate Theater

Location 44th & France South Total Depth of Well Original Reported 485

DIAMETER OF HOLE	10"	8"	New Liner 1964	Found hole Left hole	459 465
Top of Pipe above Surface	8'	Original Liner	8'		
Bottom of Pipe below Surface	87'7"	284	305		
No. of Ft. of Pipe in the Hole	79'7"	(Removed)	297		
No. of Ft. of Hole Drilled	204	283	See Notes		

TEST	1	2	3	4	FORMATION	Notes	Depth
Depth of the Hole			465				
Depth to Water at Rest	62		108				
Depth to Water Pumping							
Depth of Pump Pipe	See Note		Below				
Gallons per minute							
Will well supply more?							
Was Strainer in Hole?							
Was water clear?							
Was well pumping sand?	Some	See Report					
Hours Pumping							

STRAINER

Make		
Type of Metal		
Diameter O. D.		
Diameter I. D.		
Total Length	None	
Number		
Top of Screen below Surface		
No. of Ft. Exposed		
Bottom of Screen below Surface		
Was Str. swedged		
Did Sand come thru Str.		
Was Str. coarse enough		
Style of Fittings		

All measurements taken from Surface

Before starting repair static was 62 - after completion was 108. New liner (1964) consists of 137' of 8" (to 145' below grade) plus 160' of 6" (to 297' below grade). New liner set in 4 sacks cement which came up 14' into bottom of pipe.

Pump set on 10" casing.

Figure 7 Repair Report for Edina Cleaners Well.

(FROM BERGERSON-CASWELL, INC.)

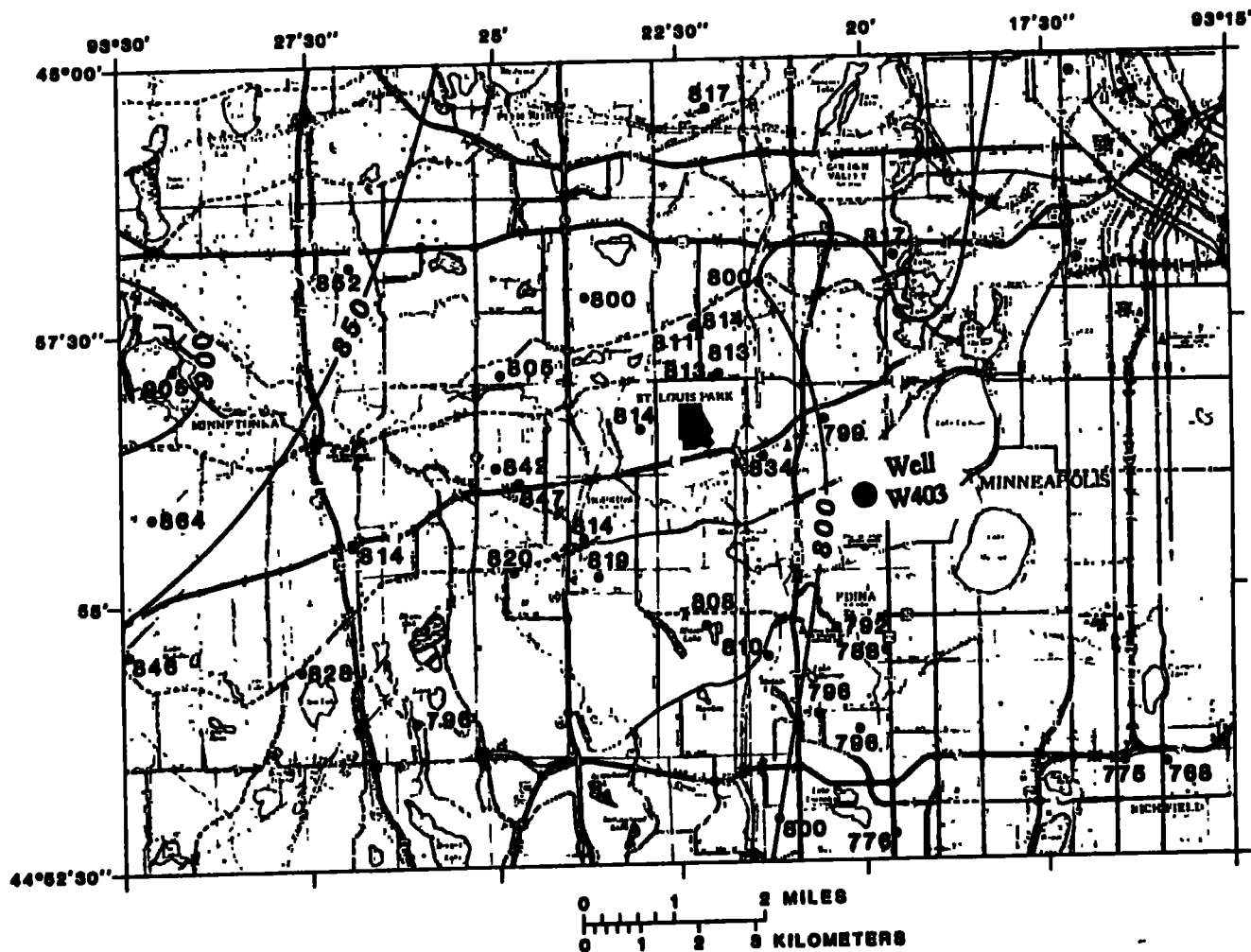


Figure 8 Generalized Potentiometric Surface of the Prairie du Chien-Jordan Aquifer, June 20-23, 1979.

(From USGS Water Supply Paper 2211)

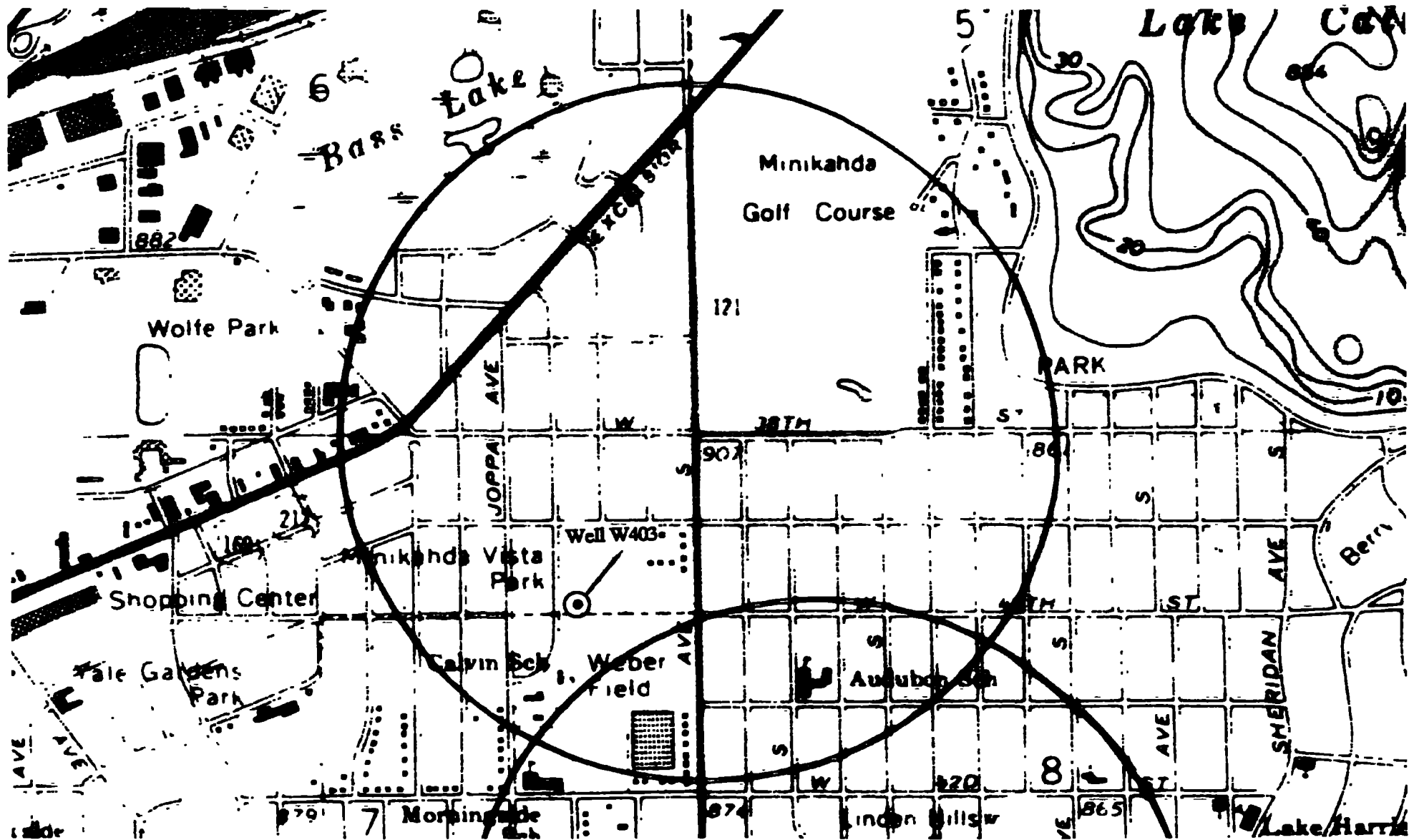


Figure 9 Location of Well W403.

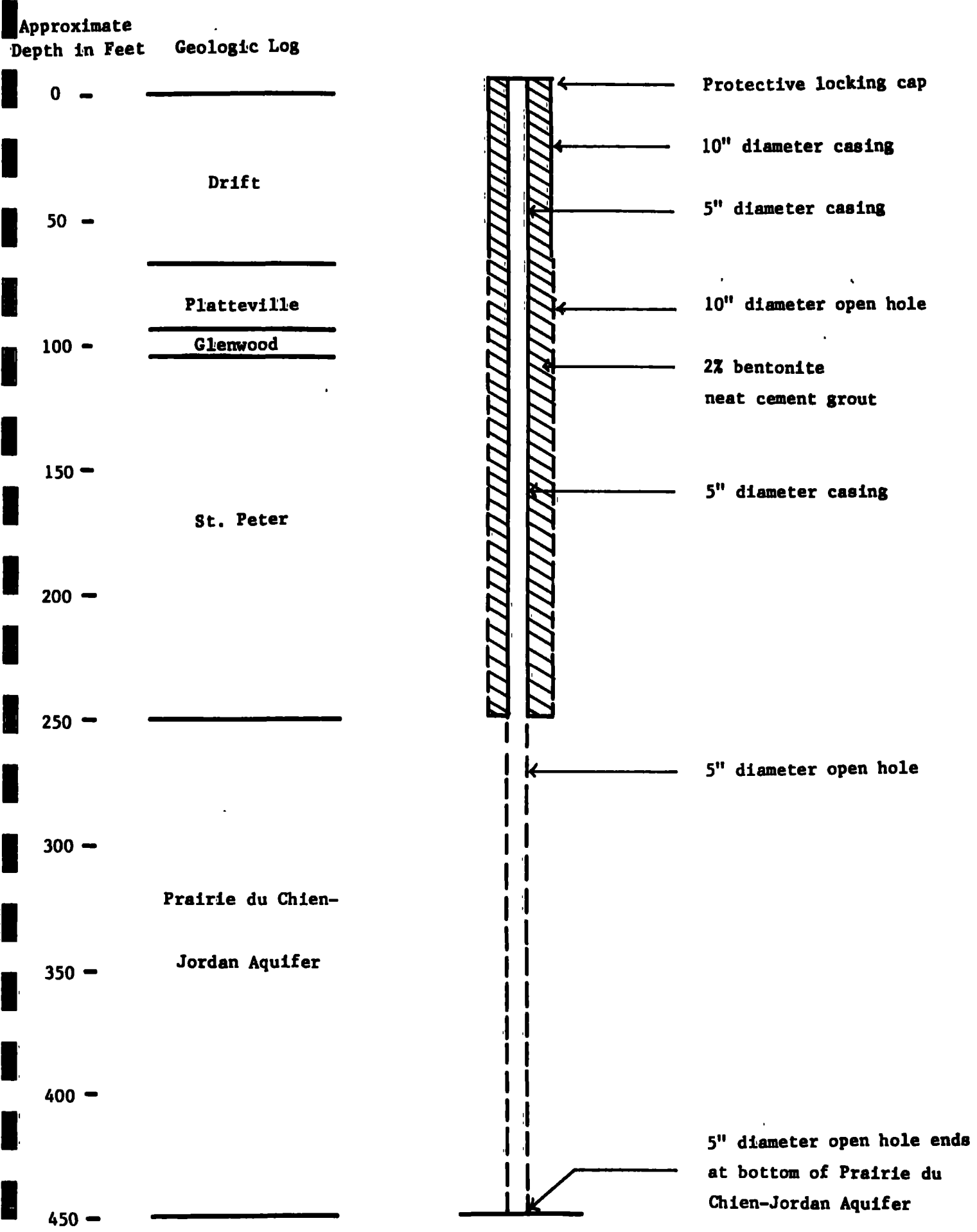


Figure 10 Well W403 Construction Details.

W403. The survey data will enable the well locations to be plotted on a suitable base map, such as the U.S. Geological Survey, 7.5 minute series topographic maps, and also allow comparison of water level data from wells W401, W402, and W403 with other Prairie du Chien - Jordan Aquifer monitoring wells.

SCHEDULE AND REPORTING

Reilly will apply for any necessary permits for constructing well W403 within 10 days of receipt of approval of this Plan. Reilly will complete construction of well W403 within 60 days of receipt of the permits. Reilly will provide oral progress reports with respect to the schedule and work activities for this project to a designated Project Leader or alternate. Following completion of the well construction, a brief written report that includes the completed well log will be submitted to all Project Leaders.

The schedule for investigating Interlachen Country Club Well No. 3 for use as monitoring well W401 involves investigating the well after it has ceased pumping for the year. The owner indicates that this usually occurs in October. Based on this scheduling constraint, Reilly will submit a plan for well W401 on or before December 31, 1987. The plan will provide the results of investigating existing wells within 2,500 feet of the terminus of Homedale Avenue south of Goodrich Street in Hopkins, in accordance with Section 7.2.5 of the RAP. If a suitable existing well cannot be found, the plan will provide construction specifications for a new Prairie du Chien - Jordan Aquifer monitoring well for use as well W401. Reilly will notify a designated Project Leader or alternate of the date that Interlachen Country Club Well No. 3 is removed from service, and will provide oral progress reports describing the project status.

SECTION B

QUALITY ASSURANCE PROJECT PLAN

SECTION B

QUALITY ASSURANCE PROJECT PLAN

**QUALITY ASSURANCE PROJECT PLAN
FOR PRAIRIE DU CHIEN - JORDAN AQUIFER
MONITORING WELLS W401, W402, W403**

ERT Document No. QAD722-273

July 1987

Prepared for:

**Reilly Tar & Chemical Corporation
Indianapolis, Indiana**

**ERT - A RESOURCE ENGINEERING COMPANY
5871 Cedar Lake Road, St. Louis Park, Minnesota 55416**

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QUALITY ASSURANCE PROJECT PLAN

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1.0 INTRODUCTION

1.1 Background

ERT and Reilly Tar & Chemical Corporation (RTCC) will complete certain tasks in fulfillment of the Consent Decree and Remedial Action Plan for the St. Louis Park Site. This Quality Assurance Project Plan pertains to all work to be performed by ERT and other contractors to install one new groundwater monitoring well in the Prairie du Chien - Jordan Aquifer. The new well will be monitored along with a network of existing wells to determine the nature and extent of contamination in the aquifer. Monitoring data will be compared with drinking water criteria for this purpose. The existing monitoring network is not adequate for determining the nature and extent of contamination, hence the need for the additional well. Further details on the work to be performed, its purpose and the methodology to be employed may be found in the Site Management Plan. The schedule for this work is to apply for any necessary permits within 10 days of receipt of approval of this plan pursuant to Part G of the Consent Decree, and complete the well construction within 60 days of receiving the permits.

1.2 Quality Objectives

The purpose of this Quality Assurance Project Plan is to define the Quality Assurance and Quality Control provisions to be implemented to ensure that:

- o The new monitoring well will conform to design and location specifications given in the Site Management Plan.**
- o The work is performed in an efficient manner.**
- o Field records generated during the course of the field work are complete and accurate.**
- o The objectives of the Consent Decree are met.**

QUALITY ASSURANCE PROJECT PLAN

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2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The project organization is illustrated in Figure 2-1. The RTCC Project Manager, Mr. John Craun will oversee and coordinate all project activities. The ERT Project Manager, Mr. William Gregg will schedule and direct all field activities and will conduct correspondence with RTCC. The Project Manager/Field Coordinator is also responsible for maintaining records of the work performed on the project and for archiving those records in the Central File upon completion of the work. The Project Quality Assurance Officer is responsible for ensuring that this plan is implemented and that project data undergo technical and peer review, as necessary. The U.S. EPA, MPCA, and MDH will have the opportunity to audit, comment on, or otherwise participate in Quality Control procedures, and inspect the work done on this project at any time. The drilling and well installation contractor will perform all work necessary to install the new monitoring well.

3.0 QA/QC - FIELD ACTIVITIES

3.1 Training

All field personnel working on this project (including subcontractors) will receive training on the purpose of the work, the procedures to be employed and the Project Health and Safety Plan.

3.2 Subcontractor Quality Control

Subcontractor quality control is that system of activities which ensures that products or services obtained from subcontractors fulfill the needs of the project. Periodic quality control inspection of each contractor will be performed by the ERT Project Manager/Field Coordinator to evaluate adherence to the project QA Plan and the project Health and Safety Plan. Inspection will include (as appropriate):

- o Type and condition of equipment,
- o Calibration procedures,
- o Personnel qualifications,
- o Decontamination procedures,
- o Documentation,
- o Level of personal protection.

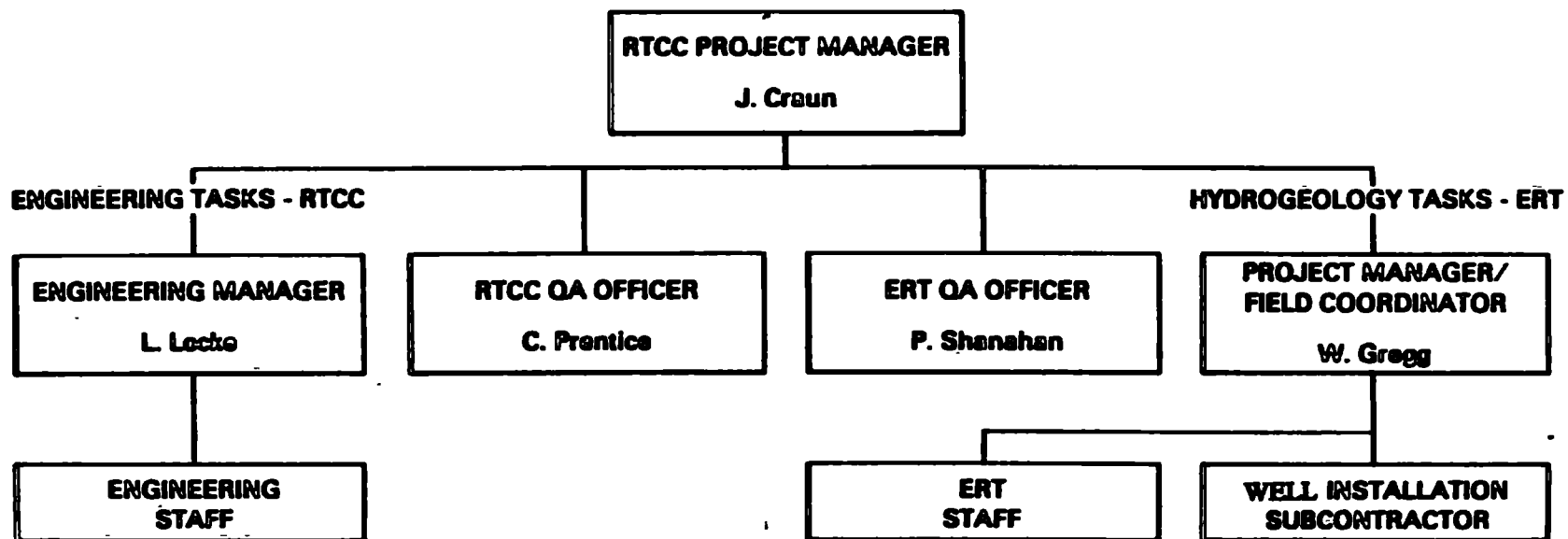


Figure 2-1 Project Organization

QUALITY ASSURANCE PROJECT PLAN

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Results of the quality control inspection will be entered in the field notebook.

3.3 Document Control and Recordkeeping

Document Control for the remedial investigation serves a two-fold purpose. It is a formal system of activities that ensures that:

- 1) All participants in the project are promptly informed of revisions of the Quality Assurance Plan; and**
- 2) All critical documents generated during the course of the work are accounted for during, and at the end of the project.**

This QA Plan and all standard Operating Procedure documents have the following information on each page:

- o Document number**
- o Page number**
- o Total number of pages in document**
- o Revision number**
- o Revision date**

When any of these documents are revised, the affected pages are reissued to all personnel listed as document holders with updated revision numbers and dates. Issuance of revisions is accompanied by explicit instructions as to which documents or portions of documents have become obsolete.

Control of, and accounting for documents generated during the course of the project is achieved by assigning the responsibility for document issuance and archiving. For this project, the ERT Project Manager/Field Coordinator has this responsibility.

Documentation for the project will either be recorded in non-erasable ink, or will be photocopied promptly upon completion, and the photocopies dated. All documents will be signed by the person completing them.

QUALITY ASSURANCE PROJECT PLAN

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3.4 Final QA/QC measures will satisfy local, state, and federal criteria and the objectives of the RAP.

4.0 NUMERICAL ANALYSIS AND PEER REVIEW

All numerical analyses, including manual calculation, mapping, and computer modeling will be documented and subjected to quality control review in accordance with ERT SOP 2005, Numerical Analysis and Peer Review. All records of numerical analyses will be legible, reproduction-quality and complete enough to permit logical reconstruction by a qualified individual other than the originator.

5.0 AUDITS AND CORRECTIVE ACTION

ERT conducts periodic audits to assess the level of adherence to QA policies, procedures, and plans.

Whenever quality deficiencies are observed that warrant immediate attention, formal corrective action request forms are issued to the project manager by the Quality Assurance Department. The QA Department retains one copy of the form when it is issued. The project manager completes the form and signs it when corrective action has been implemented, and returns the original to the QA Officer to close the loop.

The Quality Assurance Department maintains a record of all corrective action requests and reports their status to ERT management in a quarterly report.

Should an audit be conducted on this project, RTCC will be apprised of the audit findings and of any corrective action that is requested and performed.

SECTION C
HEALTH AND SAFETY PLAN

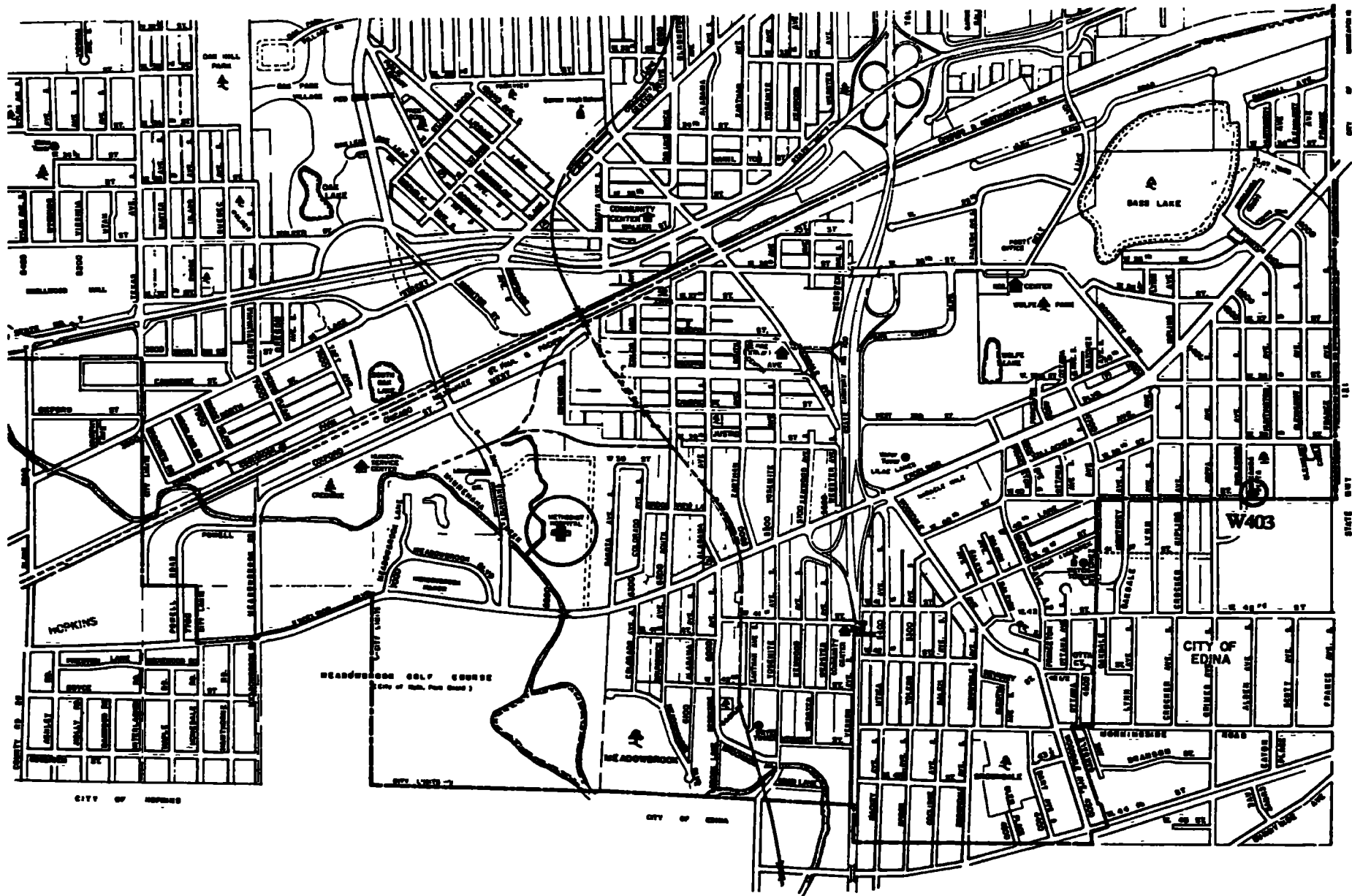
HEALTH AND SAFETY PLAN

Because the only field work for this project involves working in an uncontaminated area, there is no specific Health and Safety Plan for installing well W403. However, as in all work that involves heavy machinery such as drilling rigs, common sense safety rules apply. Hard hats will be worn in the vicinity of the drilling rig, and ear, eye, foot and hand protection should be worn, if needed.

If a worker is injured, first aid procedures will be followed and if necessary, emergency medical attention will be sought. The names and numbers for emergency services are provided below:

Fire Department	911
Ambulance	911
Police Department	911
Methodist Hospital	932-5000

Methodist Hospital is located at 6500 Excelsior Blvd. in St. Louis Park (see attached map).



LOCATION MAP

SECTION D
COMMUNITY RELATIONS PLAN

COMMUNITY RELATIONS PLAN

The Prairie du Chien - Jordan Aquifer monitoring well plan is to be completed in accordance with the Consent Decree - Remedial Action Plan for Reilly Tar & Chemical Corporation's St. Louis Park, Minnesota, N.P.L. Site. All community relations programs related to this work will be coordinated through the following agencies:

United States

**Ms. Judy Beck
United States Environmental Protection Agency
(312) 353-1325**

State of Minnesota

**Ms. Susan Brustman
Minnesota Pollution Control Agency
(612) 296-7769**

City of St. Louis Park

**Ms. Sharon Klumpp
City of St. Louis Park
(612) 924-2523**

Information necessary to conduct the Community Relations Plan will be provided by the City and Reilly.

environmental and engineering excellence

NEWBURY PARK, CA, (805) 499-1922
FORT COLLINS, CO, (303) 493-8878
WASHINGTON, D.C., (202) 463-6378
LOMBARD, IL, (312) 620-5900
CONCORD, MA, (617) 369-8910
PITTSBURGH, PA, (412) 261-2910
DALLAS, TX, (214) 960-6855
HOUSTON, TX, (713) 520-9900

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